

# Summary

Two experiments were carried out in the humid tropics of Costa Rica to evaluate the effect of competition between grasses and annual grain crops when grown simultaneously and in alternate rows, as an strategy to cover the cost of reclaiming degraded pastures dominated by native grasses (mainly *Axonopus compressus*). The present study only reports the results

obtained with annual crops (see Pérez et al., 1993 and Duarte et al., 1994 for the data on grass yield).

In experiment 1, soybean cv. IAC-8 and Jupiter were sown at a density of 200,000 plants/ha (0.5 x 0.1 m) in monoculture and intercropped with *Brachiaria brizantha* cv. Marandú or *B. dictyoneura* CIAT 6133, both at a density of 40,000 plants/ha (0.5 x 0.5 m). To define the growth pattern of all crops, total aerial biomass and leaf area were measured at five phenological stages. A randomized complete block design, with six treatments (2 soybean genotypes x 3 cropping systems) and three replications in time was used. Grain yields for soybean var. IAC-8 was 2.71 t/ha when grown in monoculture, but decreased by 12.7% and 52.0% when associated with *B. dictyoneura* and *B. brizantha*, respectively. Corresponding values for var. Jupiter were 2.48 t/ha, with decreases of 0.1 and 39.7%, respectively.

In experiment 2, maize cv. Tuxpeño or cowpea (*Vigna unguiculata*) cv. Chiricano were intercropped with either *B. dictyoneura* CIAT 6133 and *B. brizantha* cv. Marandú or dwarf elephant grass (*Pennisetum purpureum* cv. Mott). Planting densities (plants/ha) were: maize, 40,000 (1.0 x 0.5 m, 2 plants/site); cowpea, 160,000 (0.5 x 0.25 m, 2 plants/hole); dwarf elephant grass, 20,000 (1.0 x 0.5 m); and *Brachiaria*, 40,000 (0.5 x 0.5 m). The crop variables measured and the experiment design used were similar to those described for experiment 1, except that four replicates were considered in this experiment. Independent statistical analysis was also run for maize and cowpea data. In both crops, grain yields and total aerial biomass were not affected by any of the intercropping systems studied. Dry grain yields (14% moisture) were 5.95 and 2.56 t/ha for maize and cowpea, respectively. The highest decreases in grain yield, due to the association with *B. brizantha*, were only 7% and 6% for maize and cowpea, respectively.

Although the grain yield required to cover all costs of degraded pasture reclamation were widely overcome by all cropping systems including corn and cowpea (the break even points were: 3.75 and 1.44 t/ha, respectively); only those with corn as the financing crop seem feasible, since the detrimental effects on grass growth were quite lower for this crop than that exert by soybeans or cowpea.